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ABSTRACT

This booklet recommends procedures to be followed by communities who wish to obtain financial assistance under the Connecticut School Building Aid Law, with particular emphasis on economy. Subjects of general interest include: the sequence of school building procedures, allocation of responsibilities, planning time, the building committee, selecting an architect, project financing, budgeting and cost control, bidding and contracting, and the construction period. Other chapters deal with relevant Connecticut laws and regulations. (JZ)

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SCHOOL BUILDING PROJECT PROCEDURES

A Guide

for the

School Building Committee

EF 000 981

SCHOOL BUILDING ECONOMY SERIES – #1 (Second Edition)

State Department of Education

State Office Building, Hartford, Connecticut

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(Replaces Edition of June, 1960)

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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INTRODUCTION

The Connecticut General Assembly has wisely placed great responsibility on local communities for the education of their children and youth. One evidence of this policy is found in the authority given to local communities to build the kind of school buildings that people want for their young people. There are only two areas in which the State of Connecticut exercises control over school building construction:

First, the building must meet the safety requirements of the State Fire Safety Code, as interpreted by the State Fire Marshal.

Second, the building and site must meet the health requirements of the State Department of Health's regulations, as interpreted by that agency.

The final decision on all other aspects of the building as well as site selection is made by the people of the community through the local officials or agencies involved. Plans and specifications must be submitted to the State Department of Education for review. This department maintains advisory and consultative service personnel who are glad to work with local officials and their architects in developing school plant plans. The State Department of Education, however, has no authority to compel a community to follow recommendations which members of the staff may make.

The 1959 General Assembly enacted legislation requiring that the State Department of Education establish a school construction economy service to assist communities in achieving increased economy in their school building projects. It further required that each project be reviewed by this service for economy in order to qualify for state construction grants.

In order to carry out one aspect of these additional responsibilities, the State Department of Education began publishing a series of booklets known as the "Economy Series." The first edition of this booklet, published in 1960, has been widely used during the intervening years. However, legislation enacted and procedures developed during this period have made the first edition obsolete in a number of respects, especially those pertaining to the computation of grants. As a consequence, this revised edition is now published to take its place.

This booklet is intended to assist in the achievement of economical school plants through the recommendation of procedures designed and developed through experience to eliminate, insofar as is possible, wasted effort, lost time, and the resultant hidden but considerable cost.

Richard L. Howland, *Chief,*
Bureau of School Buildings

CHAPTER ONE
SCHOOL CONSTRUCTION GRANTS

In this chapter are presented the basic school construction aid statutes and the means utilized for administering them.

I. The Laws

The following include pertinent actions of the state legislature, including those of the 1967 General Assembly.

Sec. 10-282. Definitions. As used in this chapter, "elementary school building" means any public school building designed to house any combination of grades below grade seven; "secondary school building" means any public school building designed to house any combination of grades seven through twelve or any regional vocational agriculture center established under the provisions of part IV of chapter 164, and may also include any separate combination of grades five and six or grade six with grades seven and eight in a program approved by the State Board of Education when the use of special facilities generally associated with secondary schools is an essential part of the program for all grades included in such schools; "school building project," except as used in section 10-289, means the construction, extension, furnishing, equipping or major alteration of a building to be used for public school purposes, including the improvement of land therefor, with the improvements thereon, if any, but shall not include the cost of a site; "extension" of an existing school building means the addition to an existing building or the erection of a new structure or group of structures on the same site which, together with the existing building, is designed to house pupils in an educational program under the supervision of one school principal; "major alteration" means a capital improvement of an existing building for public school purposes which costs more than two thousand five hundred dollars; "completed school building project" means a school building project declared complete by the state board of education as of the date shown on the final application for grant payment purposes as designated by the secretary of the state board of education or his agent; "date of beginning of construction" means the date on which the general construction contract is signed by the authorized agent of the town or regional school district. (1967, P.A. 588, S.1)

Sec. 10-283. Application for Funds. Each town or regional school district which has completed or shall complete a school building project on or after January 1, 1957, shall be eligible to receive grants as provided in this chapter. Any town desiring a grant for a public school building project may, by vote of its legislative body, direct

the selectmen or the board of education of such town to apply to the state board of education and may authorize the selectmen or the town board of education, whichever is designated, to accept or reject such grant for the town. Any regional school board may vote to apply to the state board of education for such a grant. (November, 1949, 1951, 1953, S. 980d; 1957, P.A. 256, S.1; 593, S.2.)

Sec. 10-284. Approval of Applications by State Board. The state board of education shall have authority to receive, review and approve applications for state grants under this chapter, or to disapprove any such application if (1) it does not comply with the requirements of the state fire marshal or the state department of health or (2) it does not comply with the provisions of section 10-290d and section 10-291 calling for the filing of plans and specifications with the state board of education, except that said board in any one year shall not, without approval of the governor, approve applications for state grants for more than two regional vocational agriculture centers nor approve grants for such centers totaling more than four hundred thousand dollars. When any such application is approved, said board shall certify to the comptroller the amount of the grant for which the town or regional school district is eligible under this chapter and the amount and time of the payment thereunder. Upon receipt of such certification, the comptroller is authorized and directed to draw his order on the treasurer in such amount and at such time as certified by said board. (1967, P.A. 638, S.3)

Sec. 10-285. Acceptance or Rejection of Allotment. When any such application is approved, said board shall notify the town or the regional board of education that an allotment has been made to it for the purpose and such allotment shall be accepted or rejected by a vote of the selectmen, the town board of education or the regional board of education, as the case may be. Within five days after the taking of such vote, the town clerk, the secretary of the town board of education or the secretary of the regional school board, as the case may be, shall notify the state board of education of the action taken. (November, 1949, 1951, 1953, S.982d; 1957, P.A. 593, S.4.)

Sec. 10-286. Computation of Grant. The amount of the grant approved by the state board of education under the provisions of this chapter for any completed school building project shall be computed as follows: (a) In the case of a new elementary school, nine hundred dollars for each pupil which the school is designed to accommodate and an additional two hundred dollars per pupil station provided by specialized educational facilities, as defined by the state board of education, in such building, or one-half the cost of such project, whichever is less; (b) in the case of a new secondary school, one thousand four hundred dollars for each pupil which the school is designed to accommodate or one-half the cost of such project, which-

ever is less; (c) in the case of a new school designed to accommodate a combination of elementary and high school pupils, nine hundred dollars for each elementary pupil, an additional two hundred dollars for each elementary pupil station provided by specialized educational facilities, as defined by the state board of education, in such school building project, and one thousand four hundred dollars for each secondary pupil to be accommodated therein or one-half the cost of such project, whichever is less; (d) in the case of an extension of an existing school building or projects involving the major alteration of any existing building to be used for public school purposes, one-half of the necessary cost as determined by the state board of education; (e) in the case of a school building project in a secondary regional school district, seventy percent of the necessary project cost as determined by the state board of education; (f) in the case of a school building project in a regional school district providing accommodations for pupils in kindergarten through grade twelve for all participating towns, eighty percent of the necessary project cost as determined by the state board of education; (g) in the case of a regional vocational agriculture center, the total cost of such project, except as provided in section 10-284; and (h) in the case of a local or regional center for occupational training which serves programs authorized under section 10-266f of said supplement the total cost of such project or two hundred thousand dollars, whichever is less. (1967, P.A. 588, S.2.)

Sec. 10-286a. Grants for Occupational Training Facilities. Under the provisions of section 10-286 the state board of education may, within the limit of funds available, pay to any town or regional school district which may qualify a grant equal to the cost of constructing, remodeling, or renting and equipping facilities to be used for the purposes specified in section 10-266f on an experimental or demonstration basis on either a local or regional basis. Such grants shall not individually exceed two hundred thousand dollars and shall be paid in one lump sum upon approval by the state board of education. (1967, P.A. 588, S.6.)

Sec. 10-287. Instalment Payment of Grants. Grants under this chapter shall be paid in equal annual instalments, the number of which shall be *the same as the number of instalment payments for municipal bonds issued for the purpose of construction of the project* except in cases where the project has been fully paid for, in which cases the number of instalments shall be five or, in the case of a regional vocational agriculture center, shall be one. Grants under ten thousand dollars shall be paid in one lump sum. All orders and contracts for school building construction receiving state assistance under this chapter shall be awarded to the lowest responsible qualified bidder only after a public invitation to bid, which shall be advertised

in a newspaper having circulation in the town in which construction is to take place. (February, 1965, P.A. 361, S. 13.)

Sec. 10-288. Grants to Towns Unable to Complete Projects. Any town or regional school district having a school building project which it is unable to finance, after estimating any grant available to it under section 10-286, may, by vote of its legislative body or by vote of the regional board of education, direct the selectmen or the chairman of the board of education of such town or regional school district to apply to the state board of education for a hardship grant for such purpose. The board shall, in determining the town's or district's ability to finance such a school building project, consider among other factors for such town or for the towns comprising such district the valuation of real property within such town or district as reflected in a grand list adjusted on the basis of true market value, tax-supported bonded indebtedness, the tax rate, expenditures for school building projects since July 1, 1945, school building needs as determined by the local board or boards of education for the present biennium and for such future period as the state board deems appropriate, and planned and urgently needed capital improvements which will affect the debt burden or tax rate of the town or towns. If the state board finds that (1) the town or district is financially unable to complete such project and (2) the standard of education in such town or district will deteriorate unless a hardship grant is received for such project, the state board may, with the approval of a committee consisting of the governor, the attorney general, the comptroller and the commissioner of finance and control, make a hardship grant to such town or district in such amount as it considers necessary and proper, and may in its discretion pay such grant in one sum or in instalments. In case of a hardship grant to a regional school district, said state board may allocate the amount thereof which shall be credited to each town's proportionate share of the project or of the district's indebtedness and current expenditures as determined under the provisions of Section 10-51. (November 1949, 1953, S. 896d; 1957, P.A. 261; 593, S.7.)

Sec. 10-289. Issuance of Bonds for School Building Project. As used in this section, "school building project" means the construction, extension, furnishing, equipping or major alteration of a building to be used for public school purposes, including the acquisition and improvement of land therefor, with the improvements thereon, if any. Any town, upon approval by a vote of the members present at a regular or special meeting of its legislative body, may, without further authority from the general assembly, issue its bonds, which shall be obligatory upon the inhabitants thereof, for the purpose of financing in whole or in part any school building project.

(November, 1949, 1953, June, 1955, S. 988d; 1957, P.A. 13, S. 66; 593, S. 8.)

Sec. 10-290a. School Construction Economy Service. The state board of education shall maintain a school construction economy service for the purpose of reviewing the preliminary and final plans and specifications for any school building project and the educational program which it is designed to house and advising boards of education and school building committees regarding the suitability of such plans on the basis of educational effectiveness, sound construction and reasonable economy of cost, and for said purposes may employ the necessary staff, including architects. (1959, P.A. 611, S.1.)

Sec. 10-290b. Publication and Distribution of Information. The state board of education, through the school construction economy service, shall arrange for the collection, publication and distribution of information on procedures for school building committees, building methods and materials suitable for school construction and on relevant educational methods, requirements and materials, and shall furnish such information to towns or regional school districts planning school construction. Said board, through the school construction economy service, shall from time to time inform local officials and agencies involved in school construction of the services available under sections 10-290a to 10-290d, inclusive. (1959, P.A. 611, S.2.)

Sec. 10-290c. Advisory Committee. The state board of education may appoint a school construction economy service advisory committee from outside its membership to give advice and make recommendations to said board regarding the purpose of section 10-290a to 10-290d, inclusive. The members of said committee shall serve without compensation for their services but may be reimbursed for travel expense. (1959, P.A. 611, S.3.)

Sec. 10-290d. Establishment of Standards, Submission of Plans. The state board of education, upon the recommendation of said school construction economy service, shall establish standards of construction consistent with the purpose of section 10-290a to 10-290d, inclusive, which shall be used as a basis for reviewing preliminary and final plans and specifications. Any town or regional school district undertaking a school building project for which state aid is to be sought shall submit to the state board of education the preliminary plans and specifications for such project and the educational program it is designed to house *at such time and in such manner as the state board of education may specify.* The state board of education, through its school construction economy service, shall review such plans, specifications and programs in the light of the established standards of construction and shall report to the local officials and agencies involved in school construction its conclusions as to whether the

proposals submitted to it are consistent with such standards and, if it concludes such proposals are not consistent with such standards, it shall state in detail wherein it believes there has been a departure from such standards. (February, 1965, P.A. 340, S.1.)

Sec. 10-291. Approval of Plans. No school building project shall be undertaken except according to a plan and on a site approved by the town board of education and by the building committee of such town nor at an expense exceeding the sum which the town may appropriate therefor. A copy of final plans and specifications for all school building projects including those for the site shall be filed with the state board of education before construction shall be begun. (1967, P.A. 294, S. 1.)

Sec. 10-292. Review of Plans; Conformity with Requirements of State Fire Marshal and Health Department. Upon receipt by the state board of education of the final plans for a school building project as provided in section 10-291, said board shall promptly review such plans and check them for conformity with the requirements of the state fire marshal and the state department of health, and a written report of such review, together with the recommendations of said board, shall be made to the school building committee and to the town board of education. (1953, S. 991d; 1957, P.A. 593, S.11.)

Sec. 10-65. Grants to Towns or Districts Operating Centers. A town or regional school district operating a vocational agriculture center approved by the state board of education for program, educational need, location and area to be served shall be eligible for the following grants: (a) Within the availability of funds, the total cost, in a single grant, of constructing and equipping, approved facilities to be used exclusively for such vocational agriculture center, for the expansion or improvement of existing facilities or for the replacement or improvement of equipment therein, and (b) the total cost of operating the vocational agriculture center including the cost of instructing regular secondary school vocational agriculture students, out-of-school youth and adult students but excluding any capital outlay charges, less one-third the average per pupil cost of the previous year of operation of the secondary schools of the district with which the regional vocational agriculture center is associated times the average daily membership of the regular all-day vocational agriculture students. The board of education operating such center may charge tuition which shall not exceed the average per pupil expenditure of the previous year for all secondary school pupils in the receiving district and sending boards of education which maintain secondary school grades shall receive grants equal to one-half the tuition paid by them for vocational agriculture pupils in such grades. (1967, P.A. 638, S.2.)

II. Administering the Laws

Definition of Terms

- *"Applicant"* means the duly authorized representative of that agency designated by the local legislative body to apply for a grant. This will ordinarily be the chairman of the board of education or the first selectman, except in those cases where local charter provides for the mayor or manager to perform the functions of a first selectman.

- *"School Purposes"* means all those functions for which a local board of education is responsible, including not only the formal program of education for pupils, but supportive and administrative functions such as health, testing, school lunch, guidance, staff facilities, storage and the like.

- *"Cost of the Project"* means the aggregate cost of:
  - a. All construction contracts.
  - b. Architectural, engineering, and surveying fees.
  - c. Preparation and development of the site (but not site purchase).
  - d. The equipment which is an integral part of the school building project and the initial educational and office equipment required for its use, including furniture.
  - e. Administrative costs of the building committee, such as insurance, supervision, legal advice, printing, travel and similar miscellaneous items directly related to the carrying out of the project.

- *"Major alterations"* include:
  - a. Such structural changes as constructing, moving or removing partitions to increase the efficiency of the building.
  - b. Completing unfinished areas for school purposes.
  - c. Providing facilities for new services such as:
    —New provisions for special service rooms, for example, shops, health, offices, library, audio-visual, cafeteria—not replacements.
    —Emergency lighting, fire-alarms, sprinkler systems, safety measures—not replacements.
    —New heating, plumbing, electrical, air-conditioning and controls—not replacements.
  - d. New safety provisions required by local or state fire marshal.
  - e. Necessary equipment for any of the above.

- *"Number of pupils a building is designed to accommodate"* (pupil stations) means the aggregate number of adequate spaces provided for pupils in accordance with the minimum area allowances shown in Table 1.

- *"Regular Classroom"* means a school room planned for instructional purposes to accommodate a class of pupils under the direction of a teacher in the elementary grades, or in a secondary school in such subjects as English, mathematics, science, and social studies.

- *"Kindergarten Classroom"* means a school room especially designed to house a group of pupils and their teacher in a kindergarten program.

- *"Laboratory Area"* means a secondary school room planned especially for instruction in a subject requiring specialized space and/or equipment, and includes the spaces listed in Table 1.

- *"Specialized Educational Facilities in an Elementary School"* are generally similar in nature to laboratory areas and are so specialized in their design and equipment that their use as a regular elementary classroom is not practical, and may include the spaces listed in Table 1.

- *"Net Floor Area"* means the area of a room exclusive of space occupied by closets, toilet rooms, wardrobes, coatrooms, and similar non-educational space.

III. Formulas Used for Determining a State Grant

The State Board of Education will determine, for purposes of state aid, the number of pupils a school building is designed to accommodate (pupil stations) in accordance with Table 1. In making these determinations, the maximum number of pupil stations allowed per instructional area, except as otherwise noted, will be:

Kindergarten and pre-kindergarten	50 pupils
Elementary regular classroom or specialized educational facility	30 pupils
Secondary regular classroom or laboratory area	25 pupils

Various activities have been determined to require certain amounts of space as a minimum, with substantially more earnestly recommended.

Table 1 shows the areas recommended for each use and also includes the minimal figures upon which pupil stations will be computed for state aid purposes:

TABLE 1

	Recommended:		Minimum:	
	s.f./pupil station	Net total area	s.f./pupil station	Net total area
ELEMENTARY:				
Regular classroom	30	900	25	750
Kindergarten & pre-kindergarten[1]	40	1000	35	875
Specialized Educational Facilities:				
Library	60	1800	45	1350
Science Laboratory (incl. storage)	35	1050	30	900
Physical Education:				
Gymnasium	[2]	[2]	100	3000
Swimming Pool	[2]	[2]	60	1800
Music	[3]	[3]	[3] 25	[3] 750
Arts & Crafts (including storage)	75	2250	55	1650
Industrial Arts	60	1800	55	1650
Home & Family Living	40	1200	35	1050
Electronic Language Practice	30	900	25	750
Combination of two of the above	[4]	[4]	[4]	[4]
Remedial Reading, Speech Therapy (10 max.)	75	750	60	600
SECONDARY:				
Regular classrooms (plus storage) including English, social studies, math, science, language, stenography	30	750	25	625
Specialized Educational Facilities:				
Arts & Crafts[5] (20 max.)	90	1800	80	1600
Art: Two-dimensional (20 max.)	64	1280	55	1100
Stagecraft (20 max.)	45	900	36	720
Bookkeeping, Typing	50	1250	40	1000
Drafting	48	1200	40	1000
English Laboratory	45	1125	35	875
Ind. Arts, Jr. H.S., (incl. storage)	100	2500	82	2050
Ind. Arts Sr. H.S., (incl. storage)	144	3600	120	3000
Home & Family Living—multi-purpose	60	1500	55	1375
Home & Family Living—multi-purpose	40	1000	35	875
Music	[3]	[3]	[3] 25	[3] 750
Library	[6] 200	[6] 5000	108	2700
Language; Electronic Practice	30	750	27	675
Language Laboratory	40	1050	38	950

TABLE 1 (Continued)

	Recommended:		Minimum:	
	s.f./pupil station	Net total area	s.f./pupil station	Net total area
Mathematics	35	875	30	750
Business Machines (20 maximum)	60	1200	50	1000
Retailing	40	1000	35	875
Social Studies	[7]	[7]	36	900
Science (including storage)				
Combination Lab-classrooms	53	1325	47	1075
Laboratory—single-purpose	43	1075	35	875
Physical Education:				
Main Gymnasium	[11]	[11]	124	[8] 6200
Auxiliary teaching stations	[11]	[11]	100	[9] 2500
Swimming Pool	[11]	[11]	63	[10] 42'x75'

NOTES:

[1] Net area does not include spaces such as teachers' wardrobes, storage closets, etc. Adequate storage facilities should be provided beyond the net areas shown.

[2] Spaces larger than minimal depend largely upon the kinds of activities to be carried out. Review with consultant in this area is recommended.

[3] Ceiling heights for group music should be 14 to 18 feet. 25 sq. ft. of floor space should be provided for each pupil of the largest instrumental group expected. At least 250 sq. ft. of additional storage space is recommended. Review with music consultant is also recommended.

[4] The activities requiring a larger area per pupil station will be considered in determining the number of pupil stations for grant computations.

[5] Figures shown are for combined two- and three-dimensional work or for three-dimensional only. Add 250 s.f reserve storage each.

[6] This recommendation is for about 500 pupils. For larger numbers and detailed recommendations, review with library consultant is suggested.

[7] Additional space should be provided in library for conference rooms, carrels, construction areas and computer-assisted instruction facilities for social studies pupils. The social studies consultant can furnish details.

[8] Space shown is for two teaching stations. (50 pupil stations)

[9] Minimum width, 40'.

[10] These dimensions are for pool; deck space is additional; space will be considered two teaching stations (50 pupils) when program demonstrates space is used three out of five or more of all periods per week.

[11] Design should be in accordance with expected activities; review with physical education consultant.

New Buildings: Using the foregoing basis, the state aid grant for a new school building is as follows:

- *Elementary*—Total pupil stations x $900, plus pupil stations in "specialized educational facilities" x an additional $200, or one-half the project cost, whichever is less.

- *Secondary*—Total pupil stations x $1,400, or one-half the total project cost, whichever is less.

Extensions and Alterations: At any grade level, one-half the total project cost. Note, however, that eligible alterations are those which provide increased efficiency or services, cost $2,500 or more, and are not replacements or delayed maintenance.

Regional District Schools: Instead of the above limits, projects of K-12 regional districts meeting eligibility criteria receive a grant amounting to 80 percent of the project cost. Qualifying districts regionalized for other grades receive a grant amounting to 70 percent of total project cost.

IV. Miscellaneous Information

A. Grant Payments

Grants will be paid in equal annual instalments numbering the same as the number of bond instalment payments involved. Fully paid-for projects will receive five equal annual payments, except that grants amounting to less than $10,000 will be paid in one lump sum, as will those for vocational agriculture centers, occupational training centers and facilities for special education.

First payments will be made during the month of July, October, January, or April, whichever follows the approval of *Application for Grant Payment* (Buildings—Form 4). Subsequent annual payments on grants will be made during the same month each year until paid up.

Deadline for submission of Form 4 is one month prior to the beginning of the month during which first payment is desired.

B. Hardship Cases

Occasionally a town or regional district may face a project which it is unable to finance. Sec. 10-288 provides a means whereby the state may grant funds sufficient to carry out essential projects. The proper procedure in such cases is as follows:

STEP ONE—

The town or regional district should first prepare for its own consideration the following items:

1. A study of the town's or district's valuation of property as reflected in a grand list adjusted to true market value.
   - Should show history of valuation for the past ten years and project ten years into the future.
   - Date of last general revaluation and procedure for keeping valuations up to date.
   - History of annual tax receipts for the past ten years.
   - The average of the annual tax receipts for the most recently reported fiscal years.
   - Uncollected tax percentages by years for the last five fiscal years.
2. A study of existing tax-supported bonded indebtedness, including the schedules for payments.
3. A study of school building needs (growth) for the next ten years, as determined by the local board of education, including:
   - Population growth of town or district for the past ten years and projected growth for the next ten years.
   - Pupil population projection for the next ten years.
4. Planned capital expenditure program of the town or towns comprising the district for the next ten years, indicating:
   - Types of projects, both schools and other municipal works.
   - Estimated capital expense for each.
   - Timing or priority for each project.
5. An analysis of planned and urgently needed capital improvements as they will affect the debt burden and tax rate of the town or towns involved.

STEP TWO–

Once a careful study has been made at the local level and it appears that a town or regional district will be unable to complete essential school project(s), a report should be made to the local legislative body. To apply for a hardship grant, the legislative body must vote to direct the selectmen or board of education to do so. Forms for applying are available from the Bureau of School Buildings.

STEP THREE

The State Board of Education will review the information submitted at a regular meeting and will take one of the following actions:

1. If it finds that the town or district will be able to complete the project(s) without undue hardship and without deterioration of

the local standards of education, it will deny the application and so notify the applicant.

2. If it finds that the town or district will be unable to complete the project(s) and that the local standard of education will otherwise deteriorate, it will submit its favorable recommendations to the committee prescribed by the law, consisting of the Governor, the Attorney General, the Comptroller, and the Commissioner of Finance and Control. If this committee approves, the State Board of Education may make a grant in one lump sum or in instalments at its discretion.

C. Multiple Major Alteration Projects

Occasionally a community undertakes to do a certain type of work in several school buildings at the same time. These may be treated, for state aid application purposes, as a single project, provided that the following conditions are met:

1. All work involved shall be designed by the same architect or engineer.
2. All work involved shall be advertised, bid, and awarded to contractor(s) in the same manner as is followed for a single building, unless it is executed by regular employees of the local board of education.
3. Work involved shall be major alterations only, and shall be of a similar type in all the buildings, such as stair enclosures, plumbing improvements, sprinkler systems and the like.
4. An estimated cost breakdown for each building involved is necessary. If the cost for any one building is less than $2,500, this amount must be deducted from the project total.
5. The following items shall be submitted:
   - One set of buildings-Form 1, 2-A, 3, and 4, noting all buildings concerned where name of project is called for.
   - Resolutions of legislative body relative to the work must list all buildings concerned and indicate the type of work to be done.
   - Final plans and specifications covering all buildings must be submitted simultaneously.
   - Newspaper advertisement clipping covering all buildings as a single job, where not all done by regular local board employees.
   - Schedule of finishing hardware for all buildings, where applicable.

D. Regional Vocational Agriculture Centers

Sections 10-65 and 10-284 cover generally the special grants available for such projects. The Bureau of School Buildings should be consulted as to availability of funds for such centers. Procedures, when such funds are available, are much the same as for regular school building grants.

E. Occupational Training Centers

Sections 10-266f and 10-286a cover grants for occupational training facilities; consult with the Bureau of School Buildings as to availability of funds and procedures to be followed.

F. Facilities for Special Education

Public Act No. 627 of the 1967 General Assembly provides for supplementary grants for facilities designed and intended to meet the needs of exceptional children. Consult the Bureau of Pupil Personnel and Special Education Services for requirements and the Bureau of School Buildings as to the availability of funds.

V. Site Acquisition Grants

These grants are in addition to amounts for building projects and equal one-half the "site acquisition costs . . . which are determined to be necessary by the state board of education."

"Acquisition costs" include, in addition to purchase price, the following:

Appraisal fees
Search and title insurance
Surveys
Condemnation proceedings
Existing improvements
Investigation as to suitability prior to purchase

Area limits will be imposed, beyond which the state will not participate in acquisition costs, as follows:

Elementary—up to ten acres plus one acre per each hundred pupils to be housed.

Secondary—up to twenty acres plus one acre per each hundred pupils to be housed.

These figures apply to the anticipated total occupancy of the plant under consideration; in the case of extensions or alterations, presently owned land will be deducted from the total area computed to determine eligible area.

Site grants will be added to construction grants to determine the total amount of grant to be awarded a project. This total is the amount which will be paid in equal, annual instalments.

VI. Suggested Warnings And Resolutions:

Suggested Notice and Warning For Town Meeting

(Notice and warning for a town meeting which is called to appropriate and borrow monies for school building projects should be drawn in a manner satisfactory to the bonding attorneys involved.)

The electors and citizens qualified to vote in town meetings of the town of ..... are hereby notified and warned that a special town meeting of said town will be held in the ..... in said town at ..... o'clock P.M. on the ..... day of ....., 19..... for the following purposes, to wit:

1. To consider and act upon the appointment of a school building committee of ..... members and upon the method of filling any vacancies that may occur in such committee.

2. To consider and act upon an authorization to such school building committee to engage an architect, secure preliminary plans and specifications and estimated costs for the construction of such school building project. Report to the town to be made on or before ..... day of ....., ...
(month) (year)

3. To consider and act upon a proposal to appropriate the sum of $..... for the use of such school building committee to carry out Item 2 above.

4. To consider and act on a proposal to authorize the board of education (or the selectmen) to apply to the State Board of Education, State of Connecticut, for state aid for the purpose of the ..... building project and to further
(name of school)
authorize said board of education (or the selectmen) to accept or reject such state aid grants in the name of the town.[1]

(proper signatures)

.....

NOTE: Resolutions for the action of the town meeting may be drafted by changing the specific items of the foregoing notice and warning. For example, a resolution for Item 1, above, might read as follows:

Resolved that the selectmen appoint a school building committee consisting of ..... members. Any vacancies occurring on such committee shall be filled by said selectmen.

[1]For multiple school building projects see suggested notice and warning item on page 16.

Suggested Notice and Warning Item for Town Meeting for Multiple School Building Projects

To consider and act on a proposal to authorize the board of education (or the selectmen) to apply to the State Board of Education, State of Connecticut, for state aid, and to further authorize said board of education (or selectmen) to accept or reject such state aid grant in the name of the town on the following school building projects:

_____

_____

_____

_____

_____

Suggested Resolution for Grant Acceptance by the Board of Education or the Selectmen

We, the _____ (board of education or selectmen), as authorized by the legislative body of the town of _____ on _____ (date), do hereby accept a state grant in the amont of $ _____ for the _____ (name of school) school project, payable in _____ (number) equal annual payments of $ _____ beginning _____ (date) pursuant to and within the limitations of Chapter 173 of the General Statutes as amended; said grant having been approved by the State Board of Education _____ (date).[1]

By:

_____
(Signature)

_____
(Title)

_____
(Date)

To be signed by: TOWN CLERK (if Selectmen are the Applying Authority) — or — SECRETARY of the Board (if Board of Education is the Applying Authority).

[1]The General Statutes require the town clerk or secretary of the board of education as the case may be, to notify the State Board of Education of the action of the selectmen, or board of education, as the case may be, in accepting a grant within five days of such action. The procedures of the State Board of Education make it necessary for this statement to be submitted in duplicate.

CHAPTER TWO
SEQUENCE OF SCHOOL BUILDING PROCEDURES

While some variations naturally exist from one community to another, the following listing is intended to show the chronological sequence of the principal steps that should be taken in a typical school building project.

Educational Planning

I. The local board of education should previously have developed long range plans for the entire school system.

II. The local board of education prepares educational specifications and notifies the town of its needs.
(See "Long Range Planning and Educational Specifications for School Building Economy," Economy Series booklet No. 2, and Chapter Four of this booklet.)

Initiating The Building Project

III. The municipal legislative body designates the local board of education as a building committee, (unless a permanent public building committee exists or a special building committee is created), and authorizes and appropriates funds for:

A. Engagement of an architect, preparation of preliminary sketches and tentative cost estimates.
(Authorization should include authority to engage the architect for the ultimate construction project, if any, and provide sufficient funds to cover the appropriate fee. Preparation of preliminary sketches is not a "feasibility study" and should not be considered as such. Refer also to Chapter Eight, IID of this booklet.)

B. Investigating, optioning, and/or acquiring a suitable site.
(See *School Sites–Selection and Acquisition*, Economy Series booklet No. 3.)

C. Application by local board of education or selectmen for a state construction grant, and to accept or reject such grant in the name of the town.
(See Chapters One and Two.)

NOTE: Where circumstances permit, authorizations and appropriations may conveniently be made at a single town meeting to cover site investigations, site acquisition, preliminary sketches and basic drawings with outline specifications.

IV. *The Preliminary Application for Grant (Buildings–Form 1)* must be filed with the State Department of Education as soon as possible after the authorizing legislative action and within thirty days thereof. It is to be accompanied by the educational specifications of the local board of education and a copy of local minutes recording the legislative action authorizing the project and application for a state grant.

V. The building committee should confer with the school construction economy service. A conference at this point is optional but recommended for its value in connection with procedural advice, construction cost data, and related assistance.

VI. The building committee selects its architect.
(See Chapter Six.)

VII. The building committee takes an option on and/or acquires a site.
(See *School Sites–Selection and Acquisition*, Economy Series booklet No. 3.)

NOTE: It is illegal to construct a school on a site which has not been approved for the purpose by both the building committee and the local board of education.

Preliminary Plans And Specifications

VIII. The architect prepares sketches according to the education specifications of the board of education, plus tentative cost estimates.

IX. The building committee must confer with the school construction economy service to discuss sketches (schematic drawings) and cost estimates well before their approval by local agencies. Those present should include representatives of the local board of education, the local building committee and the architectural firm involved.

A. Preliminary (basic) drawings and outline specifications must be approved by both the local board of education and building committee.

B. *Application for Review of Preliminary Plans and Specifications* (Buildings–Form 2-A) must be filed with the State Department of Education within thirty days of the date of the above approvals, together with the forms for *Area Analysis*, *Site Evaluation*, and *Site Acquisition Cost Data*. Area Analysis form is not required for alteration projects, and Site Acquisition Cost Data form is not required where no grant for reimbursement of site purchase costs is being sought.

C. The submissions referred to above are reviewed by the school construction economy service for economy and educational adequacy; findings are reported to local officials concerned with the project.

Final Plans And Specifications

X. The municipal legislative body authorizes and appropriates funds for the preparation of working drawings, specifications, and advertising for bids, etc., if such actions have not been previously authorized.

XI. The architect prepares working drawings and specifications.

A. Final working drawings and specifications must be approved by both the local board of education and the building committee.

B. *Application for Review of Final Plans and Specifications (Buildings—Form 2-B)* must be filed with the State Department of Education, together with one copy each of the working drawings and specifications, as prepared for bidding, within seven days of the date of local approvals. A *revised Area Analysis* is required with Form 2-B if project area has been changed since the first Area Analysis form was submitted.

XII. The submitted documents are reviewed by the Bureau of School Buildings of the State Department of Education for:

A. Conformity with the requirements set forth in the educational specifications of the local board of education and the standards for economy established by the state board of education.

B. Conformity with the regulations of the State Fire Marshal.

C. Conformity with the regulations of the State Department of Health.

XIII. The project must be advertised for bids in a newspaper having circulation in the town in which the construction is to take place. A trade journal will not qualify as a newspaper for this purpose. (See Chapter One.)

XIV. The municipal legislative body authorizes construction, appropriates funds, provides for a bond issue or other source of funds, if it has not already done so.

NOTE: The wording of resolutions pertaining to bonds should be composed only upon the advice of a recognized bond attorney to assure legal exactitude. (See Chapter Seven, IV.)

XV. Bids are received and opened by the building committee. Construction contracts may be awarded only to the lowest qualified and responsible bidder; award may be made to other than the apparent low bidder providing that just cause for such action, based on qualified legal opinion, is established and evidence of same is filed with the state department of education. (See Chapters Ten and Eleven.)

Construction Period

XVI. The construction contract is executed with the lowest qualified, responsible bidder.

NOTE: To protect state grants, construction contract amounts cannot be negotiated after bidding for an amount greater than ten percent of the sum of the lowest qualifying bid plus alternates selected from those advertised for bidding.

XVII. *The Notification of Contract Award* (*Buildings–Form 3*) must be filed with the state department of education within thirty days of the award of contract. (See Chapter Eleven.) It must be accompanied by the following items:

A. A newspaper clipping of the advertisement for bids on the project.

B. A tabulation of the bids received, including alternates, indicating the apparent low bidder and the basis for this determination.

C. A statement justifying any award to other than the apparent low bidder.

NOTE: Copies of any Change Orders which might affect area, pupil capacity rating, fire safety or health are to be submitted to the State Department of Education when and as issued.

XVIII. Supervision of the construction operation is the general responsibility of the architect. On larger projects the building committee and the architect may agree to the need for full-time supervision by a clerk-of-the-works. (See Chapter Twelve.)

Acceptance Of The Project

XIX. After the project has been officially accepted as being complete by the architect, the building committee and the local board of education, and after all bills relating thereto are paid, the town's applying authority must file three copies of *Application for Grant Payment* (Buildings–Form 4) with the State Department of Education (See Chapter One). These should be carefully filled out in every respect and must be submitted at least one month prior to the anticipated payment date, as follows:

Payment Period	Deadline for Receipt of Completed Form 4
January	December 1st previous
April	March 1st previous
July	June 1st previous
October	September 1st previous

NOTE: The State Board of Education may waive certain of the procedures described above when, in its opinion, there are extenuating circumstances involving definite hardship.

CHAPTER THREE
ALLOCATION OF RESPONSIBILITIES

Confusion commonly arises as to which of the several entities involved in a project is responsible for certain phases. The following brief listing embodies the major actions under the headings of those agencies usually responsible.

I. Local Board Of Education

A. Long range planning for the entire school system.
B. Determination of specific project need.
C. Engagement of an educational consultant, architectural advisor, or architect for feasibility studies.
D. Educational specifications for specific projects.
E. Information program on school needs, for local officials and public.
F. Approval of site, preliminary and final drawings and specifications.
G. Approval and acceptance of completed projects.

II. Local Legislative Body

A. Authorization and delegation of various activities as specified by statutes and local charter, including designation of applicant for state construction grant.
B. Provisions of funds, establishment of limits on same.

III. Applicant For Grant

A. Proper submission of grant forms and associated items, acceptance of grants.

IV. Building Committee

A. Selection of architectural services including those of an architectural advisor, when desired, to assist in selection.
B. Selection and acquisition of site (If not already owned by the municipality).
C. Direction and control of architect's activities.
D. Execution of contract with builder.
E. Approval of drawings, specifications, periodic payments to contractor, finished project.
F. Carrying out provisions and regulations pertaining to the utilization of public buildings by handicapped persons. (See Chapter Nine)

V. Architect

A. Advice and assistance on selection of the site.

B. Furnishing of counsel, sketches, basic drawings and outline specifications, working drawings, specifications, contracts.

C. Assistance with the advertising for and receipt of bids and the letting of contract for construction.

D. Administration of the construction phase of the project.

E. Certification of periodic payments to contractor and of project completion as per contract.

VI. State Department Of Education

A. Establishment of standards of construction and recommendations for economy.

B. Collection, publication and distribution of information on construction methods, materials and costs for use of towns and their agent architects.

C. Provision of consultation services as indicated in Chapter Four.

D. Review of educational specifications for functional adequacy and economy.

E. Review of sketches, preliminary and final plans and specifications for consistency with standards and reports thereon to local authorities.

F. Review of and report on final plans and specifications for consistency with the State Fire Safety Code and the State Sanitary Code.

G. Review and approval or disapproval of applications for state grants for construction of school buildings.

VII. State Department Of Health

A. Investigation, upon request, of sites for sewage disposal suitability.

B. Review and approval or disapproval of plans and specifications for sewage disposal systems.

VIII. State Labor Department

A. Review and approval of plans and specifications involving elevators or dumbwaiters.

B. Establishment of minimum wage schedule for each project, which is required to be incorporated into the construction contract.

State Department Of Public Works

A. Issuance of regulations pertaining to the utilization of public buildings by handicapped persons; may be appealed to, where hardship would result from compliance.

CHAPTER FOUR
TIME FOR PLANNING

Good planning pays off; but good planning takes time. This is true for both educational planning and architectural planning. Sufficient time for these planning steps can make the difference between a pedestrian, hackneyed "solution" to your community's problem and a brilliant design of long-lasting value at reasonable initial and operating costs.

I. **Education Planning**–Local boards of education are urged to provide adequate time for sound educational planning. Likewise they are urged to finish their educational planning and make their specific needs known in sufficient time so that architectural planning need not be skimped through haste. The process should include most, if not all, of the following:

   A. Long range planning is a fundamental responsibility of the local board of education and should involve determination of basic policies on organization, curriculum content, locale, size and sequence of facilities improvements. The subject is dealt with at some length in Economy booklet No. 2. *Long Range Planning and Educational Specifications for School Building Economy.*

   B. Feasibility studies by an architectural firm are sometimes necessary before proceeding, to determine among alternatives such as constructing, remodeling, extending or abandoning school plants. Firms engaged to do this type of work should not be expected to design or sketch solutions for new work further than is necessary to make comparisons among the alternatives being considered. Since the board of education ordinarily is not in a position to award the future commission which may evolve, it should be clearly understood that there exists no commitment for any such future architectural commission. Payment for such services should be on a lump sum or per diem basis completely independent of any future architectural work which may follow.

   C. Educational specifications for a particular project indicate, in words, the requirements for a particular project, as seen by the local board of education and its professional staff. In effect, it is a statement of the problem that the architect is required to solve. The subject is treated more fully in Economy Bulletin No. 2, review of which is recommended to the reader. An "architectural advisor," (discussed more extensively in Chapter Six) can be of great assistance in developing a problem statement which is clear and specific.

II. **Architectural Planning**–Building committees, where possible, are likewise urged to provide as much time as is practical for this all-

important phase of the project. The degree of completeness of the educational specifications, as well as the complexity of the project, will affect planning time extensively. Your architect is the best source of information on the time that should be devoted to architectural planning on your project. This planning ordinarily takes place in three stages:

A. *Schematics* ("sketches" or preliminary studies)—These are design solutions in general terms and many may be made, illustrative of various approaches and solutions to a problem, both as to site and building arrangement. These are reviewed and refined until committee and architect agree upon one which seems to provide the most promising scheme for detailed development.

B. *Basic (preliminary) drawings*—These are much more complete drawings at larger scale, for studying the shape and treatment of the plan and its individual spaces. When these have been revised and refined to the point of satisfaction, all major decisions regarding the design will have been made. Supplementing these drawings are the "outline specifications," which describe in words those aspects of the project not easily shown on drawings, such as structural system, types of finish, mechanical systems and so forth. These are the "preliminary drawings" and outline specifications which must be submitted to the State Department of Education for formal review with Buildings—Form 2-A.

1. Site evaluation—The site should be reviewed and evaluated by the local authorities with professional assistance. Evidence of such evaluation should be submitted along with preliminary plans on *Site Evaluation Form* (Buildings—Form 2A-SE), which should accompany Buildings—Form 2A. If a private sewerage system is to be used, a review of the site by State Department of Health personnel should be undertaken and approval obtained at the earliest opportunity. (See also Economy Bulletin No. 3)

2. Plot plan, to scale, showing:
   - Size and shape of entire site with overall dimensions.
   - Points of the compass.
   - General topographical conditions, including contour lines.
   - Location of proposed building on the site, its future additions and any existing structures or other features.
   - A tentative development of site showing location of service and recreational areas, sewage disposal system, utility approaches.
   - Buildings on adjacent properties within forty feet of property lines.

- Adjacent streets, highways, sidewalks, other major features.
- Location of existing utilities, such as water, sewer, electricity, gas, telephone, hydrants, municipal fire alarms, traffic control devices.

3. Floor plans to scale, usually not less than $\frac{1}{8}$", to show walls, partitions, rooms, stair locations, and the like.
   - Location, sizes and purposes of all rooms.
   - Overall dimensions.
   - Future additions contemplated.
   - Adequate indication of provisions for Fire Safety Code, such as door swings.
4. Elevations, (same scale as plans) of four sides, showing generally the features of the exterior.
5. A Typical Section, or more as may be necessary to explain any conditions not made plain in the other drawings.
6. Details of featured spaces of the building, including typical "regular" classrooms, all specialized areas, at a larger scale so that intention as to equipment and layout are made clear for review by department of education specialists.

C. *Finals* (working drawings and specifications)—These are, in essence a translation of the accepted preliminary drawings into contract documents according to which the contractor agrees to construct the project. Thus, each item in a very complex structural organism must be described in detail, located with precision and correlated to the other items, and the methods by which all this is to be accomplished should be spelled out with care.

Each phase has its particular function in achieving success and the more care exercised in the early stages, the more efficient and economical will be the steps that follow.

The State Department of Education offers assistance to local boards of education and their staffs, as well as to school building committees and their architects, in the following fields:

Adult Education
Agricultural Education
Audio-visual Education
Business Education
Civil Defense
Community Use of School Plants
Curriculum Services
Distributive Education
Driver Education
Early Childhood Education
Education of the Gifted
Education of the Mentally Handicapped
Education of the Physically Handicapped
Elementary Education
English and Reading
Foreign Language Education

Enumeration
Guidance
Health and Physical Education
Homemaking Education
Industrial Arts
Interpretation of Educational Statutes
Local School Administration
Mathematics Education
Music Education
Publications and Public Information
Research
School Construction Grants
School Construction Economy Service
School Finance
School Health Services
School Library Services
School Lunch Services
School Plant Planning
School Site Selection
School Social Work
Science Education
Secondary Education
Social Studies and Citizenship
Speech and Hearing Services
Statistics

In connection with the above, however, it should be understood that the assistance offered is limited by necessity to advice and procedural guidance by specialists in the various fields.

III. **Planning Fallout Shelter**—In most municipalities, the neighborhood school plant gives us the most logical opportunity to provide shelter from radioactive fallout for large numbers of people. The Office of Civil Defense, of the U.S. Department of Defense, has for some time been urging the adoption of the "slanting" technique to this purpose. This technique simply involves designing the new structure "from scratch" in such a way that some of the educational spaces in daily school use have sufficient protection capability in case of need. There is a substantial body of evidence indicating that this can be accomplished at relatively little, and sometimes no, extra cost, provided that it is planned for from the beginning.

The need for such a shelter should be discussed with the local Civil Defense director, so that required capacity and other details can be established at the outset and understandings reached as to the various storage, food service and sanitary needs.

The State Director of Civil Defense, as well as local Civil Defense directors, will be glad to advise local authorities on matters of both policy and practice, and no hesitation should be felt in calling upon them for assistance.

If a decision is reached to incorporate fallout protection in a school plant, a Certified Shelter Analyst should be retained to assist in the design of the structure. A list of such certified analysts is maintained at the Bureau of School Buildings for reference purposes; a call to the bureau will ordinarily reveal the identities of several well-qualified analysts reasonably near to any Connecticut community.

CHAPTER FIVE
THE BUILDING COMMITTEE

New England, aside from Vermont, seems to be unique in usually injecting a "building committee" into the process of constructing school buildings. This practice is hallowed by the custom of many years and presumably has the virtue of relieving local school boards of an onerous responsibility for which it may not be well qualified. However, it also has its dangers and inefficiencies.

The danger, often realized, is that a separate building committee may become over-zealous in carrying out a mistaken concept of "economy" and finally produce a cheap, cramped and inefficient school plant which will be expensive to maintain and which will fail to perform its intended function properly. The inefficiency stems from the need for the committee members, most of whom may not have been involved heretofore with education, to learn what it is that the local school board really wants and needs. This educative process consumes valuable time if it is carried out; and, if it is not, serious misconceptions can find their way into the school plant design, causing eventual delay or a non-functional plant.

On the other hand, a school board and its staff already knows quite clearly what is needed and is sufficiently well informed to judge the adequacy of designs from an educational point of view. It seems as likely to be successful in selecting suitable architectural services as any other group, and having done so, will have available to it a responsible and qualified expert to oversee the construction process.

Thus it seems wise for any municipality to consider seriously designating its board of education as building committee for its school buildings. This should avoid the dangers and delays mentioned above, while consolidating responsibility in a single public body. And an undivided responsibility can be a very valuable asset in large municipal expenditures, as many a community would gladly attest.

However, it is expected that many towns will continue to create special building committees for school buildings. It is for such towns that the following suggestions are made:

I. Composition

Numbers—Commonly, in the creation of school building committee, the first problem is one of size. Committees can be so small that absenteeism is crippling and so large that they become cumbersome. A minimum of five and a maximum of nine members is suggested for the usual project.

Representation—By custom, and for sound practical reasons, the inclusion of members of the local board of education, board of select-

men, and board of finance is usual. Representation from a previously-functioning school study committee is naturally a sound idea. Local circumstances will usually suggest other interested bodies which might be represented. However, board representation should not be carried so far as to encumber the group with too many members to function with efficiency.

Qualifications—While formal requirements for committee membership neither exist nor are desirable, a few important qualities seem worth mentioning:

A. The willingness to spend the necessary time at meetings and otherwise to carry out the committee's functions.

B. A working knowledge of the local education system and its role in community life.

C. A reasonably sound grasp of fundamental business principles.

D. An open mind and the ability to work in a group for the common good of the community.

Sound judgment is far more important than superficial knowledge of the building industry or any part of it.

II. Organization

Generally, committee organization is fairly simple, requiring a chairman, vice-chairman, and a secretary. The chairman will be required to preside at meetings, sign certain documents for the committee when authorized, be spokesman for the committee, and work toward harmonious progress for the project. The vice-chairman customarily performs functions of chairman in the latter's absence. The secretary will be required to keep minutes of all business conducted at meetings and turn same over to the town clerk upon discharge of the committee at the project's completion. Usually there will also be a moderate amount of correspondence and the task of notifying members of each meeting.

III. Functions

A school building committee must function strictly in accordance with the charges given it by the local governing body, usually a town meeting. It is, in effect, acting as the community's agent in getting a specific school plant constructed. It should be borne in mind that responsibility for determining educational needs lies with the local board of education; the building committee's function is to provide the needed facilities in accordance with the educational specifications, and, within such limitations as may be imposed by the municipal

governing body, to expend the appropriated funds wisely so as to secure the best possible long-term value for the community.

IV. Rewards

For the time and energy spent over a period of two or three years, participating in a school building committee's work must seem to some a rather thankless task. It is hoped that citizens generally will come to possess a far greater appreciation for the unselfish community service performed by members of such committees. Meantime, each member must be satisfied by his own self-respect and that inner gratification springing from the knowledge of a difficult task well done.

CHAPTER SIX
SELECTING AN ARCHITECT

I. Importance

Of all the factors involved, the architect is uniquely in a position to "make" or "break" a school building project. Hence one of the most important responsibilities of a school building committee is the selection of the architectural firm best qualified to solve its particular problem. This is not a simple task, but effort and care thus spent are usually returned many-fold in savings and ultimate satisfaction with the results on the part of all concerned.

II. General Considerations

A. An architect is a licensed professional, skilled in the analysis and solution of building problems and construction supervision. In a contractual sense, an architect may be an individual working alone or with a small staff; a partnership of moderate size; or a large firm with a number of partners and a large staff. Largeness does not, however, necessarily indicate excellence; other factors are much more important.

B. The paramount considerations involve the architect's reputation, the quality of his previous work, and his personality.

A reputation for sound management, excellence in design and conscientious service is an architect's recommendation. The quality of his work can best be judged by the regard of his previous clients, and to a degree by knowledgeable inspection of his works. Personality can become very important in a long-term relationship with a building committee, where serious friction could be disastrous.

C. Architectural services should not be "shopped" for on the basis of price. An architect's services are intangible, as are those of other professionals. A certain amount of faith is required, just as it is in engaging an attorney or a surgeon. Fees in all professions tend to become somewhat standardized, at least as to minimum charges set for which complete and adequate service can be expected. Where maximum economy is intended, obtaining it will require particularly careful study and imaginative design by the architect; he can hardly afford to provide these critical ingredients if he is not to be compensated adequately. Skimping on architectural services is the poorest possible way to approach school building economy.

D. In considering an architect's previous work, emphasis should be given to the quality and scope of it, whether or not it is in the

school field. A firm otherwise qualifying should not be cast aside for not having previously done a school, or a school of a particular type. All architects are trained primarily as general problem-solvers in the building design field. It should be pointed out that some of the most notable advances in school design have been the result of a fresh approach by a firm new to the field.

III. Selection Methods

A. *Direct Selection*—Where a committee is well acquainted and satisfied with the capabilities of a local or nearby architectural firm, there is little reason for going through the time-consuming process of interviewing a number of architects. It is much more appropriate in this situation to select the desired firm and get on with the work at hand. There is seldom too much time for it.

B. *Interviews*—This is still the commonest procedure in Connecticut and involves a series of interviews with a number of candidates for the commission. If this procedure is considered necessary, these points should be considered:

1. Advisor—The engagement of an impartial architectural professional advisor to assist the committee in making a wise selection can be extremely helpful in many situations. Such services may be obtained at reasonable cost through the Connecticut Society of Architects—AIA. The services will provide expert assistance in screening candidates and in the proper evaluation of the experience and previous work of architects being considered (See also Chapter Four, I).)

2. Screening—On larger projects particularly, the number of candidates may seem overwhelming and may require reduction to a reasonable size for interviewing. This may be accomplished through the use of an appropriate questionnaire; the one developed jointly by the National Council on Schoolhouse Construction and the American Institute of Architects is recommended for this purpose. Samples may be obtained from the State Department of Education for examination. A careful review of the responses will usually reveal several firms with which interviews will be desired.

3. Interviewing—The number of firms to be interviewed in person should be small, preferably no more than five or six. Adequate time should be allowed for each firm to make an adequate presentation of its qualifications and for committee questioning. At least one hour per firm is recommended.

The environment should be informal, friendly, and private. Candidates may bring one to three staff members and will

often have large display boards or slide projectors and models to illustrate their presentations. Hence, space, darkening provisions and a projection screen are desirable.

No candidate should be requested or expected to bring sketches, cost estimates or other specific proposals for the project at hand, as such actions are unethical and, in fact, illegal. In particular, committees should guard against mistaking showmanship for architectural skill and competence.

4. Sketches—Asking your prospective architect to make "sketches," "proposals" or "estimates" at this point should be avoided. For one thing, it is illegal for him to do so before actually being engaged for the project. And for another, such "free" sketches or estimates are worth just about what they cost. It is also temptingly easy to be swayed in selection by an attractively low "estimate." Such figures, arrived at before designing, are relatively meaningless and have no place in the important business of selecting architectural services. Seek the firm you feel can do the best for you. Discredit claims of unique ability to create near-miracles at low cost.

5. Visitations—Those architects favorably impressing the committee after interviews will usually be glad to arrange for the committee to visit any of their completed projects. This is a golden opportunity to verify or dissolve impressions gained about the candidates and their works. It should be taken advantage of without hesitation, if at all possible.

6. Point of View—Buildings visited should be thought of as solutions to specific problems. Therefore visitors should seek from the owner to know the problem and its circumstances before attempting to judge the results. Local building committee members and school superintendents are the logical source of such information on school buildings and ordinarily are glad to be of assistance in this respect.

IV. Final Determination

After having become as well acquainted with the qualifications of the various candidates as circumstances permit, determination should be based upon considerations such as the following:

A. Has he sufficient experience in architectural work to handle all phases of the project competently?
B. Has he sufficient staff with suitable skills to carry out the work with care and without delays?
C. Has he other commitments which might interfere with proper attention to this project?

D. Has he demonstrated skill in developing school or other plants that satisfy the needs of complex and specialized occupancy?

E. Is he of unquestioned professional integrity?

G. Has he worked harmoniously with previous clients, consultants and contractors?

H. Does he properly administer the construction phase of the work and give adequate supervision?

I. Does he consistently produce buildings within his clients' budgetary limits?

J. Does he consistently provide economy of space and materials appropriate to each project?

K. Do his buildings provide a pleasant environment and a satisfying appearance?

L. Are the bids on his projects consistently close and change orders or extras few, indicating directness and simplicity of drawings and specifications?

V. Contracting For Architectural Services

In Connecticut, owner-architect contracts generally refer to or physically include the *Statement of Architectural Services and Recommended Fees*, more familiarly known as the "Blue Book." This document outlines in detail the services to be performed by the architect, the fee basis, the owner's responsibilities and many other pertinent details of the working relationship between the parties to the contract. A further source of information regarding architectural services is the booklet, *About Your Architect*, published by the Connecticut Society of Architects–A.I.A. The State Department of Education will be glad to furnish local officials with copies of these informative publications upon request.

NOTE: It should be obvious that some expert advice would be a great help in answering the foregoing questions and in evaluating the contract proposed. Here engagement of an architectural advisor to assist the committee is again recommended.

CHAPTER SEVEN
PROJECT FINANCING

While the provision of funds is primarily a responsibility of the local government, it is discussed herein for the information of local boards of education and building committees.

I. Local Debt Limits

A. *Cities and Towns*—Under the General Statutes of Connecticut (See Sec. 7-374b) no town or municipality within a town may issue bonds which would cause the indebtedness of the town or municipality to exceed the following limits:

Purposes:	Debt Limits:
General Municipal, including school	2.25 x Average Tax Receipts[1]
Additional for schools alone	2.25 x " " "
Sewers	1.50 x " " "
Urban Renewal	1.00 x " " "
Maximum Total:	7.00 x " " "

[1]Municipality's annual tax receipts averaged for three most recently reported fiscal years.

B. *Regional School Districts*—Under the provisions of Sec. 10-57 of the General Statutes, regional school district bonds have similar limitations, based upon a three-year average of aggregate tax receipts of the municipalities participating in the regional school district, as follows:

Purpose:	Debt Limits:
Schools	2.25 x Average Tax Receipts
Plus	3.50 x " " " minus the aggregate indebtedness of the municipalities comprising the regional school district.

However, this law does not supersede the former limitation statute in cases where the former basis would permit a greater indebtedness. Where the older basis is applicable, its provisions are as follows:

Cities and Towns—

Purposes:	Debt Limits:
Ordinary purposes	up to 5% of gross grand list
School Construction	up to 10% of gross grand list
Sewers	and additional 3% of gross grand list
Urban Renewal	and additional 2% of gross grand list
Maximum Total:	15% of gross grand list

Regional School Districts–

Are restrained by statutes from incurring indebtedness which would cause the total borrowing of all the participating towns to exceed 12½ percent of their combined gross grand list.

II. General Factors:

A. *Price Indices and Inflation*–Indices of current prices of important commodities and services are provided by several sources. These deserve serious study to determine current trends so as to take advantage of changing market conditions. In a longer view, these are a measure of "inflation" or the gradual devaluation of our national currency, and are useful in making decisions relative to long-term versus short-term borrowing and related problems.

B. *Interest Rates are Interesting*–The market price of "money for hire" is subject to variations according to the influence of a number of complex factors. Careful observance of trends in this field can lead to very substantial savings. Consider, for example, the implications of the following comparison of the total interest paid on 20-year bonds for $100,000 at three different rates:

Principal	Rate	Total Interest	Difference	Percent Difference
$100,000	3%	$31,500	––	––
$100,000	3½%	$36,750	$ 5,250	16⅔ (⅙ more)
$100,000	4%	$42,000	$10,500	33⅓ (⅓ more)

C. *Pay Cash and Save*–It is worth noting that the state construction grant, where short-term (five years or less) indebtedness is incurred, is reimbursed in five years instead of up to twenty annual payments. Increasingly, towns are taking advantage of the savings to be realized in this manner. (See also Chapter 108 of the General Statutes on municipal reserve funds.)

III. Non-local Help:

A. State grants for school construction and site acquisition. (Payable to the town only after construction is paid for; see Chapter One.)

B. Federal planning funds–provided, when available, to municipalities for defraying planning costs; repayable without interest from construction appropriations if the project advances into construction.

C. Federal grants to "federally impacted areas."

IV. Financial Advice:

A. *Banks*–a bank, broadly experienced in the problems of municipal finance, should be designated during the early stages of the

project so a town may take advantage of the following services offered:

1. Consultations with local boards and committees as to the financial feasibility of plans being considered, relative to community resources and other needs.
2. Advice on the relative merits of short-term and long-term financing, planning for temporary loans and related problems.
3. Extensive advice and assistance with the many complexities of a municipal bond sale.

B. *Bond Attorneys* who are nationally recognized as experts in their field should be designated and consulted whenever it is determined that a bond issue will be required. It is essential to a successful sale that many of the steps taken be executed with the strictest legal precision. Likewise, prospective investors will require the assurance of recognized legal opinion in these matters. Early consultation should assure such favorable opinion from the start.

V. Looking Ahead

Long-range educational planning, coupled with far-sighted fiscal policies, can often result in very significant savings. Consideration should be given to financing through current revenue, short-term borrowing, capital reserve fund savings, or combinations of these methods. Implicit in making such decisions is the necessity for careful evaluation of both local and general factors, taking advantage of the wisdom of acknowledged experts in these fields.

VI. Reinvestment

Quite commonly there is a significant time lag between the sale of a school building bond issue and the disbursement of the resulting funds. Investing of such funds on a short-term basis will usually realize very welcome income for the town's general fund. After the construction contract is let and the contractor's progress schedule has been agreed upon, a month-by-month table of anticipated disbursements can be prepared as a guide in making such investments. This will give reasonable assurance of the ready availability of sufficient funds when needed with a minimum of loss through idle assets.

CHAPTER EIGHT
BUDGETING AND COST CONTROL

The local board of education, the building committee, and the architect all share, at various stages, in the responsibility for budgeting construction funds.

I. Estimating

It should be clearly understood by all concerned that cost estimates are approximations, based only upon knowledge available at the time of estimating. Obviously, early estimates can only be rough approximations; as site conditions become known, plans take shape, and finishes are selected, increasingly accurate estimates become possible. Finally, when working drawings, details, and specifications are completed, bidders make their estimates for bidding purposes. The bids themselves commonly range as much as plus or minus ten or fifteen percent from their average. The successful low bidder, in becoming the contractor, agrees to construct the building for a specific price. His contract price becomes the actual cost insofar as the owner is concerned, but even the contractor will not know precisely the cost of the building until it is completed and his costs are entered into his books of account.

In view of the foregoing, therefore, the practice of fixing a firm budget figure initially seems very questionable, and may invite the following risks:

A. *Overbudgeting*–Persons experienced in the ways of an initially frozen budget tend, through sad experience, to "pad" the figures to assure adequacy in the face of uncertainty. In the frequent event that such "padded" estimates are more than sufficient, the temptation to spend the excess is often irresistible. And, at the very least, the community will have bonded itself for interest payments in excess of its real needs.

B. *Underbudgeting*–may result in these situations:

1. Some more experienced architects, suspecting a satisfactory plant at the fixed price to be an impossibility, may withdraw their candidacy for the commission, depriving the community of the possible advantages of their services.

2. Faced with the fact of very limited funds, a committee and its architect may provide a building of inferior, high-maintenance materials, or one lacking in items originally intended by the board of education. It is true that a board of education has veto power over plans and specifications, but exercising it is

frequently impractical when bidding time is at hand and progress schedules must be met in order to avoid dire shortages of space.

3. A gallant attempt may be made to provide all requirements within a limited budget, only to find at bidding time that market conditions have made success impossible. This situation results in the necessity for another appropriation with its attendant embarrassment, probable acrimony and certain loss of precious time.

A more rational approach, therefore, is to recognize the limitations of early estimates, refining the figure step by step as the plans take shape, leaving the actual appropriation of funds until after bidding, when contract price has been established. At this point suitable allowances can be made for furniture, fees, equipment and contingencies with relatively little risk of serious miscalculation.

II. Budgeting

Is most conveniently done in the following stages:

A. *Educational Specifications*—Usually, a cost estimate of some sort is necessary when a local board of education presents its needs to the local governing body. Commonly this is based on published total cost data for other Connecticut school building projects on a per-pupil or per-square-foot basis, as applied to the particular project's tentative characteristics. Estimated site-acquisition and development costs should be added to arrive at a total. Published data on architectural fees can also be used as a basis for requesting funds with which to engage an architect's services.

B. *Schematic Plans Stage*—When schematic drawings are developed, your architect will be in a position to provide tentative estimates of probable costs based on the area of the scheme developed and site improvements contemplated. It should be understood, however, that such estimates can be greatly modified by future decisions as to selection of materials, quality and quantity of equipment, market conditions, and so on. For various reasons, some towns occasionally decide to appropriate construction funds on the basis of estimates made on preliminary sketches or basic plans. The closest budget should include an amount to cover contingencies. However, an appropriation after the receipt of bids is recommended as the most economical procedure where conditions permit.

C. *Basic Drawing Stage*—When these drawings are completed satisfactorily, all basic planning decisions will have been made and outline specifications will exist. At this point, earlier estimates can

be refined considerably, but they are still subject to the vagaries of market conditions. While your architect will presumably do his best to advise you wisely in these matters, it should be clearly understood that he is in no position to guarantee his estimates. If the highest possible degree of estimating accuracy is desired, the services of a competent independent estimating firm are suggested. Such an independent and expert estimate may serve to point up errors of judgment, or overemphasis on some particular aspect of the project, and can well be worth many times its modest cost of up to one-half of one percent of the contract price for complete service.

D. *Basic Budgeting*—Involves scheduling the overall money needs for various purposes and at several stages:

1. Initial (or "sketch") Stage; funds for:
   - Site investigation and optioning.
   - 15 percent of estimated total architectural fee.
   - Committee expenses (travel, telephone, postage, legal, etc.)

2. Basic Drawing Stage; funds for:
   - Site purchase, subsoil investigations, surveys.
   - An additional 20 percent of estimated total architectural fee.
   - Committee expenses (telephone, printing, legal, etc.)

3. Working Drawing Stage; funds for
   - A further 40 percent of estimated total architectural fee.

4. Bidding Stage; funds for:
   - Blueprints, specifications, miscellaneous reimbursibles.
   - An additional 5 percent of total architectural fee.
   - Committee expenses (advertising, printing, legal, etc.)

5. Construction Stage; funds for:
   - Contract amount plus contingency fund, for monthly payments.
   - Remaining 20 percent of architectural fee, monthly payments.
   - Superintendent of project, if required.
   - Equipment and furnishings.
   - Committee expenses, including insurance.

III. Project Accounting And Control

A. *Project Fund Accounting*—will vary in method and detail with the local community and will usually be prescribed by local fiscal officials, modified by federal agency requirements when federal construction funds are involved. Whatever the local situation is, the building committee is advised to acquire a clear understanding of the procedures to be followed in disbursing funds from the beginning, so as to assure the prompt meeting of obligations without embarrassing irregularities.*

B. *Contract Accounting*—is carried out by the architect through his monthly "certificates of payment" to the contractor. Each of these will ordinarily contain a statement of the contract status at the end of the period involved, showing any changes in the contract price, amounts previously paid, amounts now due, amount of retainage, and balance to completion.

*The use of "Property Accounting for Local and State School Systems," Bulletin No. 22, 1959, Office of Education, Department of Health, Education and Welfare, is recommended for project accounting so as to be compatible with future local school plant cost accounting.

CHAPTER NINE
LEGAL REQUIREMENTS

Certain legal requirements must necessarily be fulfilled on all public school building projects. Other legal requirements must be carried out so as to qualify for state construction grants or to comply with local ordinances. The major items to consider include the following:

I. State Construction Grants

Requirements hereunder are set forth in detail in the chapter titled "School Construction Grants." (See Chapter One.)

II. State Fire Safety Code

All applicable provisions must be complied with. The State Department of Education reviews contract documents of each project for such compliance, reporting any deviations and will deny state grant approval to any non-complying project. Code is established by the State Fire Marshal and is interpreted as necessary by:

Office of the State Fire Marshal
Public Safety Division, Connecticut State Police
100 Washington Street, Hartford, Connecticut

III. State Sanitary Code

All applicable provisions must be complied with. The State Department of Education reviews and will deny grant approval to non-complying projects similarly to violations of the State Fire Safety Code. State Sanitary Code originates with the State Department of Health and is interpreted by:

Environmental Health Services Division
State Department of Health
79 Elm Street, Hartford, Connecticut

Working drawings and specifications for sewage disposal systems and swimming pools must be submitted to that agency for approval, together with formal application on a prescribed form, and signed by a local official.

IV. Architectural Services

It is illegal for persons other than those registered in this state as architects to furnish architectural services for the usual public school building project. The State Department of Education main-

tains a current roster of such duly registered architects for reference, or a copy may be obtained from:

Architectural Registration Board
295 Treadwell Street
Hamden, Connecticut 06517

V. State Labor Department

Statutes also require certain employment preferences and working conditions, as well as establishment and posting of minimum wage rates on all public projects. The State Department of Labor should be consulted for each contract and appropriate text should be included in contract documents.

In addition, high pressure boilers, elevators, dumbwaiters and escalators are subject to regulation by that agency; when these mechanisms are employed, and for necessary contract provisions, consultation is recommended with:

State Labor Department
200 Folly Brook Boulevard
Wethersfield, Connecticut 06109

VI. Access To State Highways

Driveway connections to state highways, and associated drainage conditions should be reviewed before proceeding, with:

State Highway Department
24 Wolcott Hill Road
Wethersfield, Connecticut 06109

VII. Accessibility By Handicapped Persons

All public buildings, including schools, are subject to the requirements of a code titled "Making Buildings Accessible to, and Usable by, the Physically Handicapped." Copies of the regulations and interpretations should be secured from:

State Department of Public Works
State Office Building
Hartford, Connecticut 06115

VIII. Dams Or Diversions Of Watercourses

Are subject to review and approval of:

Water Resources Commission
State Office Building
Hartford, Connecticut 06115

IX. H. P. Transmission Lines

Are occasionally a matter of concern in a school project. Consultations on such matters should be arranged with:

Public Utilities Commission
State Office Building
Hartford, Connecticut 06115

X. Storage Of Public Records—Vaults

The design and detailing of vaults intended for the storage of public records are subject to state regulation. Where such facilities are involved in a school project, plans should be reviewed with:

Examiner of Public Records
State Library and Supreme Court Building
Hartford, Connecticut 06115

XI. Municipal Planning Commission

Must approve the location and acquisition of land for a new public school building; disapproval may be overruled by a two-thirds vote of a town or city council, warden and burgesses, representative town meeting, or by a majority vote of a town meeting, according to the form of local government. (See Sec. 8-24 General Statutes)

XII. Local Codes

Many Connecticut municipalities have adopted building codes, with local enforcing officers and approval procedures. Building committees and their architects should ascertain the facts in this regard for the community involved, so that all local requirements are satisfied.

XIII Local Fire Marshal

Each Connecticut municipality has a fire marshal charged with responsibility for the safety of the public, particularly with regard to fire and panic hazards in public structures and places of assembly. While this official, particularly in the smaller communities, seldom has established a pre-construction approval procedure, consultation with him by the architect is a wise precaution. Mutual understanding developed during the planning stage will often forestall embarrassing differences of opinion after construction is complete.

XIV. Town Attorney

Should be consulted on the legal aspects of site optioning and acquisition as well as for reviewing contracts before executing same.

He should also be available to the building committee for legal counsel during the progress of the work, as conditions may require.

XV. "Open Spaces" Program

Arrangements for state and federal funding of "open space" lands adjacent to school plants should be made with:

State Department of Agriculture and Natural Resources
State Office Building
Hartford, Connecticut 06115

CHAPTER TEN
CONTRACT DOCUMENTS

The contract documents for a building project include the working drawings, the specifications and the "Form of Agreement," all of which are furnished by the architect. Since these are the basis upon which contractors establish their bid prices, their quality can have a most important bearing on the prices received. No attempt is made here to discuss this highly technical aspect of the architect's service, other than to point up the significance of:

I. General Conditions

These cover in detail the relationship between the parties to the contract, the owner and the contractor, as well as that of the architect to both in relation to the work. In addition, all general duties of the contractor are enumerated here. Included on public school projects should be:

1. Statements regarding non-discrimination.
2. Statement on preferential employment.
3. Statement on provisions for handicapped persons. (See code—Chapter Nine, VII)
4. Provisions for performance bonds.

II. Scope

It is essential that every kind of material, method, or equipment required be spelled out precisely as to kind, quality, quantity and location. Likewise, the relationships and responsibilities for all parties concerned under all circumstances must be set forth in detail.

III. Clarity

All of this must be accomplished with a minimum of duplication, ambiguity or omission. Obviously, uncertainties and duplications at bidding time lead to higher figures and widely spread prices, while omissions can result in later "extras" with consequent embarrassment and higher costs.

A. Alternates to be bid upon should be held to a reasonable minimum and should be very clearly stated so as to avoid any possible confusion. Where practicable, the "additive" type of alternate is recommended.

B. Equality of materials or methods should be clearly stated, preferably by listing in each case those materials or methods which will be acceptable without further negotiation. Lengthy descriptions

which do not name specific items which are acceptable often lead to uncertainty on the part of bidders, with consequent higher prices.

III. Time

In order to achieve adequate scope and clarity so as to avoid costly errors, sufficient time is necessary to do the job properly. It is highly uneconomical to "rush out" a set of contract documents to bidders. Additional time spent in checking for errors, omissions and inconsistencies will usually be made up by the contractor in speedier completion and at less cost to the owner.

IV. Separate Contracts

In the interest of undivided responsibility and efficient construction without delays, it is recommended that all fixed items in the structure be included in the "general contract." Cash "allowances" may be provided to cover kitchen equipment, finishing hardware and miscellaneous items for which detailed drawings, specifications or scheduling are not completed at bidding time. Attempts by the owner to handle such items independently will often lead to delays on the job more costly than the small fee amount that may be saved.

CHAPTER ELEVEN
BIDDING AND CONTRACTING

Connecticut law requires public, competitive bidding on all major public building projects and contract awardance only to the lowest qualified and responsible bidder. It is usual to let one "general contract" for the entire work to a single firm. This vests both control and responsibility for uninterrupted progress toward completion in one entity, the "general contractor," usually resulting in a more efficient operation and always resulting in simpler and less costly supervision for the owner.

Building committees are well advised to be guided by their architect through the intricacies of bidding and contract-letting. However, for maximum economy, the following points should be considered:

I. In advertising for bids, avoid, if possible, timing coincident with other projects which may compete for bidders' attention; preferably, bids should fall due on a Tuesday, Wednesday or Thursday, avoiding particularly Mondays, or days following a holiday.

II. Winter construction is hardly the technical problem it was a few years ago. However, bid period timing should be such that the builder can count on being "out of the ground" and enclosed before very cold weather. Bid time should particularly be such as to allow sufficient time for completion when needed, without the need for expensive overtime work or the unhappy alternative of completion delay beyond opening date. And care should be taken to "go out to bids" at a time when competition among projects of similar scope is not keen, if this is at all possible.

III. Provide sufficient time so that bidders can secure adequate sub-bids and prepare properly careful "take-offs" of the job. This will usually require at least three weeks, and more for major projects.

IV. Avoid requiring unrealistically short completion times, which lead to higher construction costs, naturally reflected in the contract price.

V. Exercise the greatest care allowable under the law in the selection of the general contractor from among the low bidders. Be very sure, however, to consult competent legal advice before deciding to eliminate an apparent low bidder.

VI. Omissions and Deletions—It sometimes occurs, through unfortunate circumstances, that insufficient funds are available for completion of a project as developed in its final stages. On an emergency basis, certain items may be omitted for postponed installation. Such items are more economically omitted from the plans or made subject to the "additive alternate" procedure, rather than having to be negotiated

after receipt of bids. The following list includes items which may, under dire necessity, be temporarily omitted with the least inconvenience in plant operation:

- Floor coverings—(hardening of exposed concrete floors is then essential and an added cost).
- Public address equipment and wiring. (Install conduit and boxes, however).
- Wall and ceiling painting.
- Concrete floors in basement areas.
- Classroom sinks (Install roughing, however).
- Acoustical tile.
- Ceramic tile wainscots.
- Lockers or wardrobes. (Temporarily use hookstrip or similar device.)
- Stage equipment and some lighting elements.
- Gymnasium dividing partition.
- Rolling bleachers in gymnasium.
- Classroom clocks. (Install roughing.)
- Certain planting, walks, drives, parking areas, etc.

NOTE: To protect state grants, construction contracts cannot be negotiated after bidding for an amount greater than 10 percent of the sum of the lowest qualifying bid and alternates selected from those advertised.

CHAPTER TWELVE
CONSTRUCTION PERIOD

The building committee can usually relax a bit after the contract is let, but not too much. Other matters will claim its attention periodically, such as:

I. Full-time Superintendence

As distinguished from the architect's periodic inspections, may be desirable, depending upon the size of the project, its complexity, and the manner in which the contractor carries out his work. Such persons may be employed either by the owner or by the architect (with costs reimbursed by the owner). Decision as to the necessity for and selection of personnel for this work should be jointly shared by the committee and the architect. Persons well qualified for this work are rather scarce and selection should be undertaken with care, bearing in mind that a poor superintendent (sometimes called "clerk-of-the-works") is likely to be far worse than none at all.

II. Periodic Payments

To the contractor fall due in monthly instalments, less a retained percentage and vary in accordance with the amount of physical completion of the work. The contractor requests and the architect, if satisfied as to correctness, certifies to owner as to the amount then due. At this point the committee formally approves payment by the fiscal officer of the municipality. Arrangements should be made for expediting this process so that payment is made promptly in accordance with the terms of the contract.

III. Construction Insurance

Is ordinarily provided by the owner, as set forth in the contract. This may usually be purchased on the basis of a flat percentage of the ultimate cost of the structure, or on the basis of a percentage value of the completed work, month by month.

IV. Equipment And Furniture

Will be required for occupancy and are ordinarily selected and ordered during the construction period. Usually the administrative staff of the board of education is consulted in detail as to needs if they are not clearly stated in the educational specifications and ordering is done so as to assure delivery in ample time for unpacking and other handling. Interim storage may be required to avoid interference with contractor's activities on the job.

V. Change Orders

Are documents which modify the provisions of the contract as to quantity or kind of materials, methods, or price and may result from many different causes. Routine change orders are those which adjust the contract price to conform to actual prices for items originally covered with cash allowances in the contract, such as facebrick, finishing hardware, kitchen equipment, lockers, contractor's contingency fund and so forth. Formal approval of all change orders by the building committee and the architect is required.

VI. Occupancy

Circumstances frequently require partial or complete owner occupancy of a project before completion. This situation can be the source of bitter dispute as to responsibility for defects. It is urged that necessity for early occupancy, if foreseen, be clearly stated in the contract documents, together with the terms under which it is to occur. In any event, a careful inventory of existing conditions and a clear understanding with the contractor regarding defects should be established prior to any actual occupancy by the owner.

VII. Completion

Will first be "substantial," and later, actual. The former state is best defined in the contract, especially if final payment is keyed thereto, and is usually such time as the project can be (legally) occupied for its intended purpose, even though certain corrections and adjustments remain to be done.

VIII. Acceptance

Is a formal statement acknowledging actual completion in accordance with the terms of the contract. Such statements are required of the architect, the building committee, and ultimately, the board of education.

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